FINAL

FOR PHASE 1 KIRTLAND AIR FORCE BASE TECHNOLOGY PARK



MARCH 2005

Prepared For Air Force Research Laboratory

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En	SUBJECT Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for Phase I, Kirtland Air Force Base Technology Park (SOCCER # 1253000)								JUN 2 3 2005		

SUMMARY

1. PURPOSE: Obtain AFMC/CV signature on proposed FONSI (Tab 1).

2. BACKGROUND:

- a. The Air Force, in conjunction with the New Mexico Institute of Mining and Technology (NM Tech), proposes to construct and operate Phase I of Kirtland Technology Park (KTP) on a 36-acre site on Kirtland Air Force Base (KAFB). The KTP would house a consortium of military, academic and defense industry professionals performing scientific research and technology development in support of aerospace and space-based weapon systems. The KTP would primarily benefit Air Force Research Laboratory's (AFRL) Directed Energy and Space Vehicles Directorates which are headquartered on KAFB, allowing AFRL to drastically reduce the timeline for development and delivery of new weapon systems.
- b. Phase I of the KTP would consist of four facilities: the DoD STARBASE Education Program facility (existing, constructed in 2003), a National Defense Technology Auditorium (classified conference center), a Space Vehicle Component Development Laboratory, and a NM Tech sub-campus (to be developed under an enhanced use lease). The proposed 36-acre KTP Phase I construction site is located within the densely developed NW corner of KAFB, in an area formerly occupied by military family housing. Additional vacant acreage abuts the site and would allow for future KTP expansion. AFRL is developing plans for up to three additional KTP phases.
- c. Because the proposed action involves a non-Air Force entity, the EA (Tab 2) and FONSI must be approved by the MAJCOM Environmental, Safety and Occupational Health Committee (ESOHC) as stated in the Air Force Environmental Impact Analysis Process (32 CFR 989). AFMC/CV chairs the AFMC/ESOHC and is the appropriate signature authority. ESOHCs at AFMC and Kirtland AFB have independently evaluated and approved the scope and content of the EA and FONSI. Furthermore, 377 ABW/CC's transmittal memo requests that AFMC/CV approve the FONSI as soon as possible.
- 3. RECOMMENDATION: AFMC/CV sign the proposed FONSI (Tab 1).

LARRY O. SPENCER Brigadier General, USAF Director of Mission Support

3 Tabs

- 1. Proposed FONSI
- 2. Final EA
- 3. 377 ABW/CC Memo, 25 May 05

FINDING OF NO SIGNIFICANT IMPACT FOR KIRTLAND TECHNOLOGY PARK, PHASE I KIRTLAND AIR FORCE BASE, ALBUQUERQUE, NEW MEXICO

Pursuant to the Council on Environmental Quality's regulations implementing the National Environmental Policy Act (40 CFR Parts 1500-1508) and the Air Force Environmental Impact Analysis Process, as promulgated at 32 CFR Part 989, Department of the Air Force has completed an Environmental Assessment (EA) of the impacts associated with construction and operation of a technology park at Kirtland Air Force Base (KAFB). The technology park would house Phillips Technology Institute (PTI), a consortium of military, academic and defense industry professionals performing research and development in scientific fields related to aerospace and space-based weapons systems.

Purpose and Need

Air Force Research Laboratory's (AFRL) Directed Energy (DE) and Space Vehicles (VS) Directorates are headquartered on KAFB. These directorates are responsible for integrating and transitioning emerging science and technology into existing and future military weapon systems. DE and VS focus areas include high-power microwaves, lasers, adaptive optics and imaging. Currently it takes about one and one-half decades to complete the cycle from initial research to delivery of new high-tech weapon systems into the hands of the warfighter. The time to complete this cycle has grown exponentially in parallel with the increasing complexity of advanced technology. In order for the United States to secure and maintain space superiority, this cycle time needs to be drastically reduced. The proposed Kirtland Technology Park (KTP) would facilitate this by providing an environment where the PTI's military, academic and defense industry elements could interact cooperatively on leading-edge scientific research, technology development and related military applications. The technology park would also support space technology training and advanced-degree education.

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVE

Proposed Action. The Air Force, in conjunction with New Mexico Institute of Mining and Technology (New Mexico Tech), proposes to construct KTP Phase I over the next five years. Phase I includes two new Air Force facilities, a National Defense Technology Auditorium and a Space Vehicles Composite Development

Laboratory and a subcampus of New Mexico Tech. New Mexico Tech would construct and operate the subcampus on land leased from the Air Force. A fourth building, the existing STARBASE education facility built in 2003, would be included as part of Phase I. These structures would be located on a previously developed, 36-acre site on KAFB. This is the only site on Kirtland which is near existing AFRL DE and VS facilities, which also can be expanded to accommodate future phases ultimately envisioned for KTP over the next 25 years.

No-Action Alternative. Under this alternative, AFRL would not develop the KTP, but would continue to use existing facilities. Operations would continue at AFRL as they currently occur.

SUMMARY OF ANTICIPATED ENVIRONMENTAL EFFECTS

Proposed Action. The proposed action would have negligible impacts on health and safety, noise levels, land use, utilities, geological resources, water resources, biological resources and cultural resources. It would not disproportionately affect children, minorities, or low-income populations and there would be no increased risk from hazardous materials or wastes. Impacts to other resources are summarized below.

Air Quality. The proposed action would create relatively short-term negative impacts to air quality during construction. Construction equipment produces carbon monoxide (CO), but the maximum potential CO emissions from Phase I construction would be well below the *de minimis* level established for the Albuquerque area. Fugitive dust emissions from earth moving would be minimized by the use of Best Management Practices as specified in the required Fugitive Dust Control permit. Long-term minor impacts to air quality associated with operation of the proposed facilities would occur from a minor increase in vehicular traffic accessing the base. These impacts would not be significant.

Transportation. The proposed action would have a minor long-term negative impact on street transportation as a result of increased vehicular traffic from students and faculty accessing New Mexico Tech subcampus. However, impacts to off-base transportation routes would not be significant.

Socioeconomics. Socioeconomic impacts from the proposed action would be beneficial, but negligible in a metropolitan area the size of Albuquerque. Salaries paid to construction workers, local purchases of construction materials and local rental of construction equipment would have minor, short-term, beneficial impacts on the local economy.

Visual Resources. Visual resources would benefit by construction of KTP Phase I over the current site conditions as the proposed site is now vacant and unimproved since demolition of previous facilities. While the site itself would be improved by new construction, KTP would not have a significant impact on the visual character of the area.

Cumulative Effects. KAFB is a large, active, military installation with more than 400 organizations housed in facilities that were built from 1940 to present. As a result, demolition of old facilities, new construction, facility improvements and infrastructure upgrades occur regularly. An analysis of the cumulative effects of these projects concluded that there would not be any significant environmental impacts.

No-Action Alternative. Under this alternative, there would be no changes to current air quality, transportation, socioeconomics or visual resources.

Public Comment. A public notice was published in The Albuquerque Journal on 24 October 2004 inviting the public to review and comment upon the EA. The public comment period closed on 23 November 2004. No comments were received.

Finding. Based on my review of the facts and analysis as summarized above and detailed in the attached EA, I find the proposed action will not have a significant impact on the human environment either by itself or in consideration with the cumulative impacts of other foreseeable actions. Accordingly, requirements of the National Environmental Policy Act, the President's Council on Environmental Quality regulations and the Air Force Environmental Impact Analysis Process have been fulfilled; therefore, an environmental impact statement is not required and will not be prepared.

RICHARD V. REYNOLDS

Lieutenant General, USAF

Vice Commander

24 Jus 05

Date

LIST OF ACRONYMS AND ABBREVIATIONS

ABW	Air Base Wing	NDTA	National Defense Technology
ADT	Average Daily Traffic		Auditorium
AEHD.	Albuquerque Environmental Health		National Environmental Policy Act
	Department	NMAC	New Mexico Administrative Code
AFB	Air Force Base	NO_X	oxides of nitrogen
AFRL	Air Force Research Laboratory	O_3	ozone
CAA	Clean Air Act	PM_{10} P	articulate Matter Equal To or Less
CEQ	Council on Environmental Quality		Than Ten Microns in Diameter
CFR	Code of Federal Regulations	PRS	Phillips Research Site
CMU	Concrete Masonry Unit	PSD	Prevention of Significant
CO	carbon monoxide		Deterioration
DE	Directed Energy Directorate	PTI	Phillips Technology Institute
DoD	Department of Defense	ROI	Region of Influence
DOE	Department of Energy	SIP	State Implementation Plan
EA	Environmental Assessment	SO_2	sulfur dioxide
EPA	Environmental Protection Agency	SOW	Special Operations Wing
°F	degrees Fahrenheit	SVCDL	Space Vehicles Component
FY	Fiscal Year		Development Laboratory
HAP	Hazardous Air Pollutant	tpy	tons per year
HM	Hazardous Material	V/C	volume-to-capacity ratio
HW	Hazardous Waste	VOC	volatile organic compound
KTP	Kirtland Technology Park	VS	Space Vehicles Directorate
LOS	Level of Service	USAF	United States Air Force
NAAQ			
111110	Quality Standards		

FINAL

ENVIRONMENTAL ASSESSMENT FOR

CONSTRUCTION AND OPERATION OF PHASE I OF THE

KIRTLAND TECHNOLOGY PARK AT KIRTLAND AIR FORCE BASE, ALBUQUERQUE, NEW MEXICO

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SECTION 1 PURPOSE AND NEED FOR THE PROPOSED ACTION

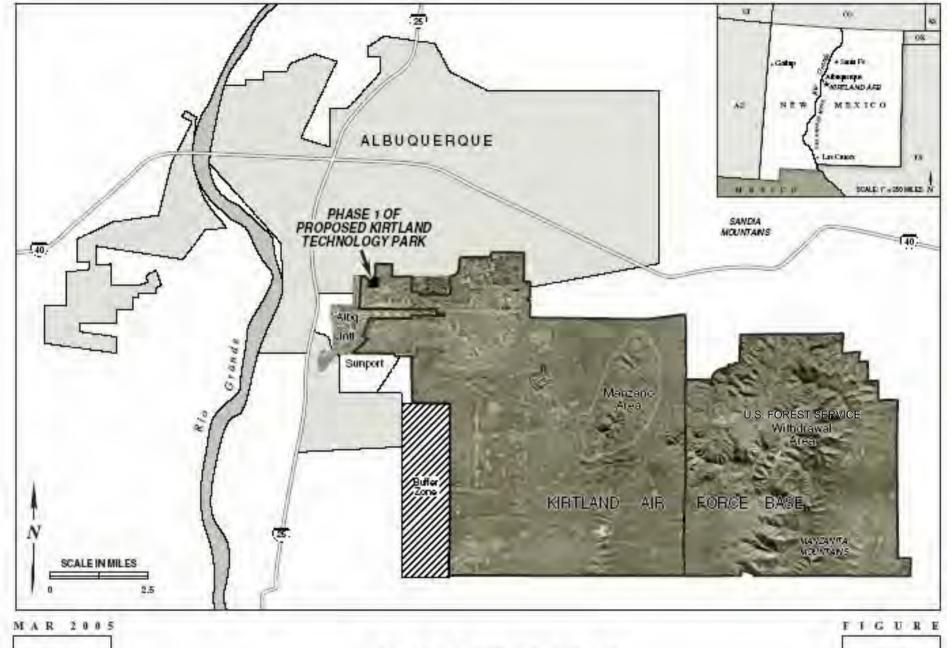
This Environmental Assessment (EA) assesses the potential impacts of the proposed construction and operation of Phase I of the Kirtland Technology Park (KTP), a potential multi-phase development at Kirtland Air Force Base (AFB) in Albuquerque, New Mexico. The proposed development could occur over the next 20 to 25 years, although only Phase I would occur in the next three to five years. Construction and operation of Phase I is the Proposed Action addressed in this EA. This EA describes all reasonable alternatives to the Proposed Action, including the No-Action Alternative, and evaluates the potential impacts on environmental resources that would result. This document is part of the Environmental Impact Analysis Process set forth in Title 32, Code of Federal Regulations (CFR), Part 989, which incorporates Air Force Instruction 32-7061 and implements the National Environmental Policy Act (NEPA), and the regulations implementing NEPA promulgated by the President's Council on Environmental Quality as Title 40 of the CFRs Parts 1500-1508.

The Air Force Research Laboratory (AFRL), an associate unit on Kirtland AFB, and the New Mexico Institute of Mining and Technology ("NMT" or "New Mexico Tech") are the proponents of the Proposed Action. The AFRL is comprised of nine technology directorates, four of which are headquartered at Kirtland AFB. The Proposed Action would improve the facilities available to the Directed Energy (DE) and Space Vehicles (VS) Directorates. The AFRL is responsible for research and technology development basic to future and existing Air Force aerospace and space weapons systems. The DE and VS directorates develop, integrate, and transition science and technology into tools for the modern warfighter.

New Mexico Tech, located in Socorro, New Mexico was originally founded in 1889 as the New Mexico School of Mines. Over the years, the school's mission has expanded, and it is now an outstanding research university, specializing in areas of science, engineering, and related fields. It has become a leader in many areas of research, including hydrology, astrophysics, atmospheric physics, geophysics, homeland security, information technology, geosciences, energetic materials engineering, and petroleum recovery. The Technology Transfer Support Group at New Mexico Tech partners with the AFRL Phillips Research Site to facilitate the transfer of technology to industry and to provide education outreach activities, and would occupy one of the Phase I facilities.

1.1 BACKGROUND

Kirtland AFB is located just southeast of Albuquerque, New Mexico in Bernalillo County at the foot of the Manzanita Mountains (Figure 1-1). Kirtland AFB encompasses over 52,000 acres with elevations ranging from 5,200 feet to almost 8,000 feet above mean sea level (US Geological Survey 1990 a, b, c; 1991 a, b, c). The base was originally established in the late 1930s as a training base for the Army Air Corps, and grew rapidly with US involvement in World War II. After the war, Kirtland AFB shifted from a training facility to a test and evaluation facility for weapons delivery.



EA

Kirtland Air Force Base Location

1-1

Kirtland AFB is now operated by the 377th Air Base Wing (377 ABW) of Air Force Materiel Command. The 377 ABW's prime mission, as the host unit at Kirtland AFB, is munitions storage, readiness, and base operating support for approximately 76 federal government and 384 private sector tenants and associate units (Kirtland AFB 2004).

Kirtland AFB serves as a center for research and development for AFRL and Sandia National Laboratories. The base functions as a test and evaluation center for Air Force Space and Missile Systems Center and Air Force Operational Test and Evaluation Center. It is also the headquarters for operational organizations such as the Air Force Inspection Agency, the Air Force Safety Center, and the Albuquerque Operations Office of the US Department of Energy.

1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

Advancements in directed energy and space technologies are critical to the maintenance of military superiority. However, the cycle of time it takes to research, develop, and transition these critical technologies into the hands of the warfighter has grown exponentially as the complexity of the technology has advanced. The current research and development to transition cycle is about 1½ decades, which puts the ability of the Unites States to secure and maintain space superiority in serious jeopardy.

In order to drastically reduce this cycle time, it is necessary to approach technology research, development, and transition in an entirely new and creative way. The DE and VS directorates within AFRL envision the solution to this dilemma in a consortium of military, academic, and defense industry professional operations co-located at Kirtland AFB that would be called the Phillips Technology Institute (PTI). The AFRL envisions these three elements of enterprise interacting cooperatively to provide leading-edge research and development, new technology methods, technology transition, advanced-degree education, and space technology training. Not only would the PTI have the potential to shorten the "research-to-acquisition" cycle resulting in the transition and transferring of appropriate technology to the field more quickly than currently possible, but it would have the potential to reinvigorate an aging workforce through educational and industrial partnerships.

The PTI, located at the KTP, would maximize the potential within government, industry, and academic sectors for space and directed energy advances that anticipate and meet or exceed future warfighter requirements. The PTI would also provide new infrastructure for rapid and affordable technology transition through focused, cooperative research programs while creating a unique multidisciplinary intellectual environment for the scientific, educational and technical workforce.

In order to provide a physical environment for the Proposed Action to operate effectively, there is a need to construct facilities to support their various activities. The earliest needs are to develop a sub-campus for New Mexico Tech, a classified conference center, and a Space Vehicle Component Development Laboratory.

SECTION 2 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVE

The Phillips Research Site (PRS) of the Air Force Research Laboratory (AFRL), located at Kirtland Air Force Base (AFB) in Albuquerque, New Mexico proposes to construct and operate Phase I of the Kirtland Technology Park (KTP) at the base. This Environmental Assessment (EA) evaluates the potential impacts on the environment that would result from that Proposed Action which, if implemented, would occur during the next three to five years. Phase 1 would consist of approximately 36 acres upon which three major facilities are planned for development. Any construction of successive phases would require separate environmental analyses.

2.1 SITE SELECTION CRITERIA

For this Proposed Action, alternatives were required to address the need to provide a site of sufficient size to accommodate all of the facilities ultimately envisioned for the KTP. The selected site also had to be near the existing AFRL Directed Energy and Space Vehicles Directorate facilities that are currently located on Kirtland AFB. The AFRL occupies a group of buildings that are located directly south of the proposed KTP Phase I location. The two primary building are immediately across the street from the Phase I area and others are in the three blocks running south from there. In addition, existing government property was a requirement, since the size of the KTP would make purchase of new land in the immediate vicinity of the base extremely costly. Areas requiring extensive demolition of existing active facilities were eliminated from consideration due to the costs of demolition and relocation of personnel and activities to other facilities. There was only one area on base that met these criteria: the areas of military family housing in the northwest portion of the base that have been demolished or are scheduled for demolition in the next few years. No other areas met all of the criteria.

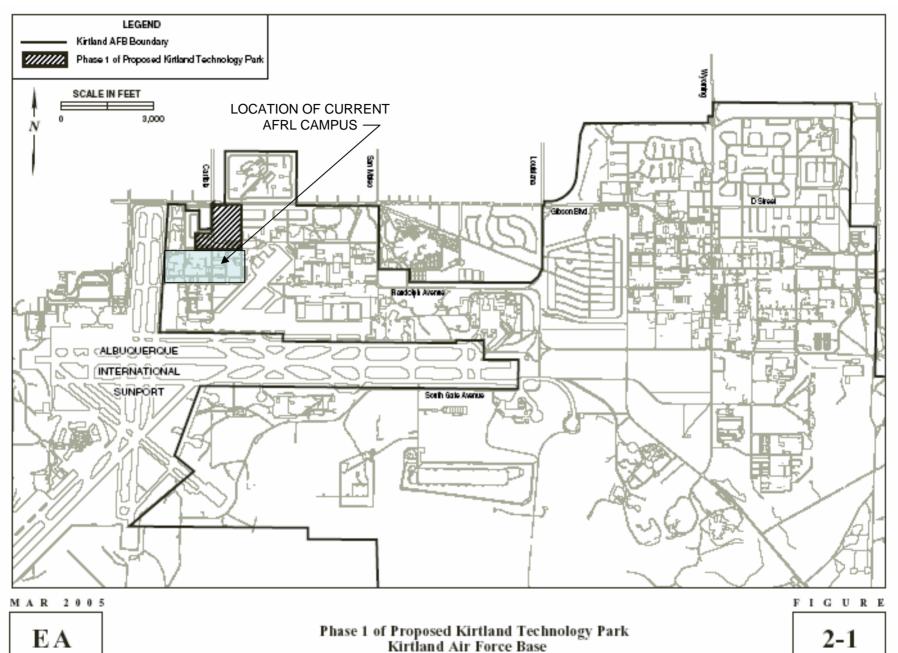
The following section describes the Proposed Action in detail and the alternative to that action.

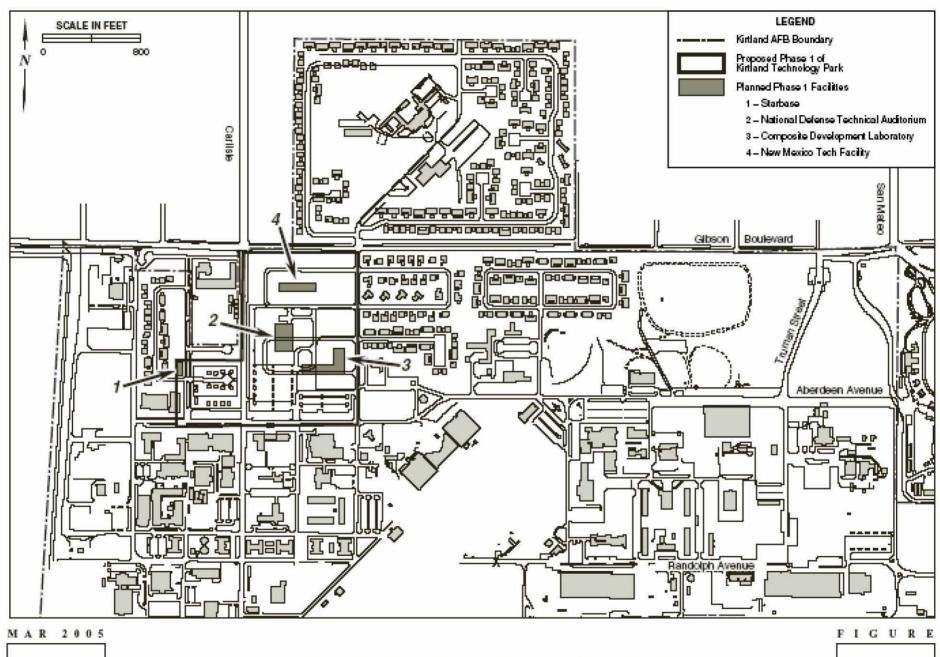
2.2 DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action is the construction and operation of a sub-campus for New Mexico Tech, a classified conference center and a Space Vehicle Component Development Laboratory (SVCDL) on approximately 36 acres on the north-western portion of Kirtland AFB (Figure 2-1).

Phase I would incorporate the existing STARBASE which was built in the fall of 2003 at the west-most border of KTP Phase 1 to support the Department of Defense's (DoD) STARBASE Education Program. Construction for this facility was addressed under separate environmental documentation (STARBASE Program Classroom Categorical Exclusion, 18 July 2003) and is not considered in this EA.

Facilities planned for construction during Phase 1 are as follows (refer to Figure 2-2):





3

 $\mathbf{E}\mathbf{A}$

Phase 1 Facilities of Proposed Kirtland Technology Park Kirtland Air Force Base

2-2

The National Defense Technology Auditorium (NDTA) would be located southeast of the intersection of Ranger Loop and Carlisle Blvd. Kirtland AFB needs a classified conference facility with multiple security levels to bring together DoD, Department of Energy (DOE), Department of Homeland Security and industrial organizations to coordinate classified research and user needs in support of research and development in lasers, high power microwaves, and space technologies. Due to the sensitivity of AFRL applications and the nature of their customers, there are a variety of highly sensitive and classified programs with classified conference needs. The NDTA would meet this critical need for a classified conference facility, including multiple security levels, for 450 persons. It would be a 32,400 square-foot building which would have a reinforced concrete foundation and floor slab and steel-framed metal walls and roof. A parking lot would be constructed adjacent to the new building to provide approximately 140 parking spaces. Parking spaces and associated driveways would require approximately 42,000 square feet.

The SVCDL would be located northwest of the intersection of Maxwell St. and Aberdeen Ave. This facility would be used to develop solar arrays and photovoltaic cells, space power storage, space vehicle mechanisms, mechanism controls, space protection (including radiation-hardened electronics), and environmental sensors (including focal plane arrays and cryo-coolers). The SVCDL would provide space for ten separate laboratories. Additionally, it would house administrative space used for analysis, engineering, engineering support, and management. The SVCDL would be a 40,000 square-foot multi-level building which would have a reinforced concrete foundation, concrete masonry unit (CMU) walls, structural steel framing, and an insulated, standing-seam, metal sloped roof system. A parking lot would be constructed adjacent to the new building.

The New Mexico Tech Facility is proposed as a sub-campus of New Mexico Tech, for research and development in support of the AFRL, DoD, National Security Agency, DOE, Sandia National Laboratories, Los Alamos National Laboratories, and the Department of Homeland Security. The facility would be a multi-level building of at least 20,000 square feet which would have a reinforced concrete foundation, CMU walls, structural steel framing, and a standing-seam, metal-insulated, sloped roof system. A parking lot would be constructed adjacent to the new building. It would be located on the southeast corner of the intersection of Gibson Blvd, and Carlisle Blvd.

The three new facilities in Phase I would be operated by individuals from both on-base and off-base locations. Table 2-1 shows the breakout of those individuals by the various groups from which they would be drawn. The majority of these personnel are either currently employed or are students in the Albuquerque area. No new jobs would be created by the Proposed Action. Instead, it would provide modern facilities in an accessible campus atmosphere that would encourage joint research and development activities by AFRL and New Mexico Tech to expand.

Table 2-1. Phase I Personnel

	Phase 1
Military	26
Government Civilian	81
Government contractor	107
Non-Govt. Civilian/Students	1,926
Total Personnel	2,140

Personnel in the first three categories in the table are already employed on base and would move from existing AFRL facilities to the new Phase I facilities once they were complete. The space in the facilities being vacated is suitable for reuse and will be used to alleviate crowding of personnel throughout the AFRL PRS. Most of the research scientists, faculty and students that would occupy the New Mexico Tech Facility (Non-Govt. Civilian/Students) would be drawn from other existing facilities elsewhere in Albuquerque. A few professors or students from the Socorro campus of New Mexico Tech could utilize the sub-campus for specific research projects.

2.3 PERMITS

Individual construction sites (or common sites of development) that would result in disturbance of greater than one (1) acre of total land area are required to be permitted under the National Pollutant Discharge Elimination System General Permit for Storm Water Discharges from Construction Activities (Federal Register 2003). These construction activities require the preparation of a Storm Water Pollution Prevention Plan and a Notice of Intent to discharge in accordance with the General Construction Permit language. The permitting of these construction activities would be coordinated through the Kirtland AFB Environmental Management Branch, Compliance Section.

Any active operations that would disturb between three-quarters of an acre (32,670 square feet) and 25 acres of total land surface require the submittal of a Fugitive Dust Control Permit and Fugitive Dust Control Plan application to the City of Albuquerque Environmental Health Department Air Quality Division. The Fugitive Dust Control Permit application and plan must be submitted at least 10 working days before the start of construction in accordance with New Mexico Administrative Code (NMAC) Title 20, Chapter 11, Part 20, (20.11.20 NMAC).

2.4 ALTERNATIVE TO THE PROPOSED ACTION

2.4.1 No-Action Alternative

Under this alternative, the AFRL would not develop the KTP at Kirtland. Operations would continue at AFRL as they currently occur. No AFRL facilities would be constructed within the KTP area.

2.4.2 Alternative Considered but not Carried Forward

Under one proposed alternative, the AFRL would develop a portion of the Proposed Action at Kirtland AFB using available space in existing facilities scattered across the developed area of the base. This alternative would severely restrict the development of the Proposed Action in that there would be minimal space available for occupancy that has not been earmarked for existing operations and transit time between facilities would be much greater than the Proposed Action. As a result of these restrictions, this alternative was not carried forward for analysis in this document.

SECTION 3 AFFECTED ENVIRONMENT

Only resource areas that would experience either positive or negative impacts if the Proposed Action were implemented are discussed in detail below.

The following resources would not be impacted by the Proposed Action: health and safety, noise, land use, utilities, geological resources, water resources, biological resources, cultural resources, environmental justice, and hazardous materials and waste management. The rationale for dismissing each of these resources from detailed consideration is given at the beginning of Section 4.

3.1 AIR QUALITY

3.1.1 Definition of Resource

Outdoor air quality in a given location is described by the concentration of various pollutants in the atmosphere. Air quality is a function of several factors, including the quantity and dispersion rates of pollutants in the region, temperature, the presence or absence of inversions, and topographic and geographic features of the region. For the purposes of this Environmental Assessment, Bernalillo County forms the region of concern for air quality. Appendix A provides additional detail on air quality and lists the National and New Mexico Ambient Air Quality Standards.

3.1.2 Existing Conditions

3.1.2.1 Climate and Regional Air Quality

The climate in the Albuquerque area is mild, sunny, and dry. The State of New Mexico, as well as the City of Albuquerque can be classified as a mild, arid or semiarid continental climate with light precipitation, abundant sunshine, and low relative humidity (New Mexico Climate Center 2004). High temperatures at Kirtland Air Force Base (AFB) average 90 degrees Fahrenheit (°F) and low temperatures average 62°F during the summer months. Winters have an average daily low temperature of 32°F and an average daily high temperature of 58°F (October to April) (New Mexico Climate Center 2004). Annual average precipitation in Bernalillo County ranges from 8 inches in the county's arid valley and mesa areas to 30 inches in the mountains east of Kirtland AFB.

The Albuquerque Environmental Health Department (AEHD) performs air quality functions in Albuquerque, and the Albuquerque-Bernalillo County Air Quality Control Board governs them.

The City of Albuquerque has been designated as being in maintenance status (formerly nonattainment for a criteria pollutant, but has achieved attainment status) for carbon monoxide (CO) as of 15 June 1996 and is currently in attainment for all other federally regulated pollutants (Environmental Protection Agency [EPA] 1996). CO levels are

currently at their lowest since the 1970s (CO levels were consistently violated during the 1970s and 1980s). Ozone (O_3) levels have been increasing since 1990 and exceeded standards twice in 1999 (AEHD 2000). O_3 is created by chemical reactions between oxides of nitrogen (NO_X) and Volatile Organic Compounds (VOCs) in the presence of sunlight (EPA 2003). Emissions from automobiles and industry are major sources of NO_X and VOCs.

Table 3-1 displays 1999 CO emissions data for Bernalillo County. These are the latest accurate data available from the AEHD (AEHD 2003).

Table 3-1. Criteria Pollutant Emissions Inventory of Bernalillo County (1999)

Source Category	CO (tpy)	NO^2	$PM_{2.5}$	PM_{10}	SO_2	VOCs
Highway Vehicles ^a	129,939	13,139	277.1	370.5	520.1	10,390
Off-Road Vehicles ^b	48,580	2,625	263.47	286.87	284.75	3,446.94
Industrial Processes	1,166	8,414	188.8	310.20	3,058.38	235.9
Misc (fugitive dust)	0	0	10,381	59,938	0	0
Waste Disposal & Recycling	6,491.9	200.88	656.74	659.46	6.83	455.37
Aircraft	996	451	6.61	9.59	43.3	149
Railroads	25.3	252	5.67	6.31	14.7	10.8
Area Sources ^c	3,341.67	1,829.2	598.9	613.40	106.33	10,034.38
Agriculture & Forestry	0	0	18.7	111	0	0
Storage & Transport	0	0	0	0	0	2,118
TOTAL	190,540	26,911	12,398	62,305	4,034.39	26,842

Source: Environmental Protection Agency 2002.

Notes: a Highway vehicles include: motorcycles, light and heavy duty gasoline and diesel vehicles and trucks.

b Off Highway vehicles include non-road gasoline and diesel vehicles.

CO=carbon monoxide tpy=tons per year NO₂=nitrogen dioxide

 $PM_{2.5}$ =particulate matter equal to or less than 2.5 micrometers in diameter PM_{10} =particulate matter equal to or less than 10 micrometers in diameter

SO₂=sulfur dioxide VOCs=Volatile Organic Compounds

3.1.2.2 Air Emissions from Kirtland AFB

The primary sources of emissions in the project area are from car exhaust, aerospace ground equipment, aircraft engine test facilities, and paint booths (United States Air Force [USAF] 2004a). Table 3-2 shows air emissions for criteria pollutants and Hazardous Air Pollutants (HAPs) for the entire base.

c Area sources include residential wood burning, natural gas combustion and propane combustion, electric utilities, solvent utilization (dry cleaning and surface coating), as well as other small stationary point sources.

Table 3-2. Summary of Calendar Year 2003 Air Emissions for Non-exempt^a Sources at Kirtland Air Force Base

	Emissions				
Pollutant	Actual ^b	Allowable			
CRITERIA POLLUTANTS AND PRECU	RSORS	(tpy)			
СО	16.7	123.6			
NOx	19.4	187.3			
PM (dust)	13.4	42.0			
SO_2	2.7	20.4			
VOCs	62.0	166.3			
Total HAPs	4.0	12.9			

Source: United States Air Force 2004a.

Notes:

^a Sources considered non-exempt under 20.11.42 NMAC – Operating Permits.

These cumulative totals include emissions from 20.11.40 NMAC – Source Registration, 20.11.41 – Authority-to-Construct, and Title V sources.

tpy=tons per year CO=carbon monoxide NO_X=oxides of nitrogen

PM=particulate matter SO₂=sulfur dioxide VOCs=volatile organic compounds

HAPs=hazardous air pollutants NMAC=New Mexico Administrative Code

An inventory was completed at Kirtland AFB in which a list of facilities with air emissions (both criteria pollutants and hazardous pollutants) was developed. All of the pollutants were then quantified for facilities on the list. There are a number of facilities located on the installation that generate periodic emissions. The inventory calculated the total potential air emissions using the quantities of hazardous and toxic pollutants maintained at each facility. Based upon the results of the emissions study, Kirtland AFB is subject to Title V permitting requirements of the Clean Air Act. Kirtland AFB is currently a minor source of HAPs. Hazardous pollutant emissions come from aircraft engine testing, fire training, fuel dispensing, fuel loading, open burning, aboveground storage tanks, underground storage tanks, and external floating roof storage tanks.

3.2 VISUAL RESOURCES

3.2.1 Definition of Resource

Visual resources are defined as the natural and manufactured features that constitute the aesthetic qualities of an area. These features form the overall impression that an observer receives of an area (i.e. its landscape character). An area's susceptibility to visual impacts is related to visual sensitivity. Highly sensitive resources include national parks, recreation areas, historic sites, wild and scenic rivers, designated scenic roads and other areas specifically noted for aesthetic qualities.

3.2.2 Existing Conditions

The visual environment in the project area is characteristic of military and civilian airfields. Structures include hangers, maintenance and support facilities and navigational equipment. The area surrounding the existing site of the Proposed Action consists of predominantly older residential, administrative and recreational facilities. The site itself

was an old housing area from which all structures have been removed and is now an unimproved area consisting of bare dirt, a few weeds and dead trees. The trees and landscaping were irrigated when the housing was occupied. The trees died after housing demolition. They are still standing and dominate the visual character of the site. They are the only remaining portion of the landscaping that previously accompanied the housing area. All lawns, sidewalks, shrubbery, etc. were removed with the houses, leaving bare dirt.

3.3 TRANSPORTATION

3.3.1 Definition of Resource

Transportation and circulation refer to the movement of vehicles throughout a roadway network. Roadway operating conditions and the capacity of the system to accommodate vehicles are described in terms of volume-to-capacity (V/C) ratio, which is a comparison of average daily traffic (ADT) volume to roadway capacity (Table 3-3). The V/C ratio corresponds to a Level of Service (LOS) rating, ranging from free-flowing traffic conditions (LOS "A") for a V/C of less than 60 percent, to congested "stop-and-go" conditions (LOS "F") for a V/C at or near 100 percent.

Table 3-3. Level of Service and Volume-to-Capacity Ratio Descriptions

LOS	Quality of Traffic Operation	V/C Ratio
A	Free flow. Very good.	< 0.60
В	Stable flow. Good.	0.61 - 0.70
C	Approaching unstable flow. Poor.	0.71 - 0.80
D	Unstable flow. Very poor.	0.81 - 0.90
E	Forced flow. Approaching failure.	0.91 - 1.00
F	Long delays. Failure.	≥1.00

Source: Transportation Research Board 2000. Highway Capacity Manual, Highway Research Board Special Report

209, National Academy of Sciences, Washington, DC

Notes: LOS=level of service V/C=volume-to-capacity

3.3.2 Existing Conditions

Major east-west arterials in the project area include Gibson Blvd. and Aberdeen Ave. Carlisle Blvd. and Truman St. are the main north-south arterials. The Carlisle Gate would provide access to the KTP Phase I area. The Proposed Action could also be accessed through the Truman Gate from Gibson Blvd or along Aberdeen Ave. The Truman Gate is currently being relocated south on Truman St. to Aberdeen Ave. The new gate would provide paved parking areas, security gates, signs, fencing and landscaping. The extended distance from Gibson to the Truman Gate as well as the additional parking areas are improvements that would facilitate traffic flow.

3.3.2.1 Circulation in Project Area

Access to Kirtland AFB is gained through seven entrance/exit gates (Figure 3-1). Traffic flows relatively smoothly in the western portion of the developed area due to light traffic

volumes and favorable intersection operations. Traffic problems on Kirtland AFB generally occur during peak traffic periods (6:30 to 8:00 a.m. and 2:45 to 5:00 p.m.). Figure 3-1 shows the transportation network for the base and LOS ratings for major roads in the vicinity of the proposed project.

3.3.2.2 Traffic Volumes

Table 3-4 shows the traffic volumes for the roads and intersections within the project area. Because the base is the largest employer in the Albuquerque area, it is the principal destination in the southern side of the city for commuters. As a result, traffic tends to converge on the base gates with high ADT volumes and occasionally poor LOS ratings. The portion of Gibson Blvd. adjacent to the project area experiences 34,200 trips per day (Mid-Region Council of Governments 2004). No LOS ratings are available for this segment of roadway.

Table 3-4. Kirtland Air Force Base Traffic Analysis Data

			A.M. Pe	ak Hour	P.M. Peak	Hour
Street/Arterial and Location	Lanes	Speed	Volume	LOS	Volume	LOS
Carlisle Blvd. (south of Carlisle Gate)	4	25	699	С	579	С
Maxwell St. (north of Aberdeen)	2	15	38	В	55	В
Truman St. (south of Truman Gate)	2	25	980	D	859	С
			Peak	Peak	Average	
Intersection	AI)T ^a	Hour	Car/hour	Car/hour	LOSb
Carlisle Blvd. and Aberdeen Ave.	4,5	512	6:45 a.m.	903	188	В
Truman and Aberdeen Ave.	8,9	904	6:45 a.m.	1,083	371	A (a.m.) B (p.m.)

Source: Kirtland Air Force Base 1999.

Notes: a ADT is defined as the number of vehicles in a 24-hour period.

LOS=level of service ADT=average daily traffic

3.4 SOCIOECONOMICS

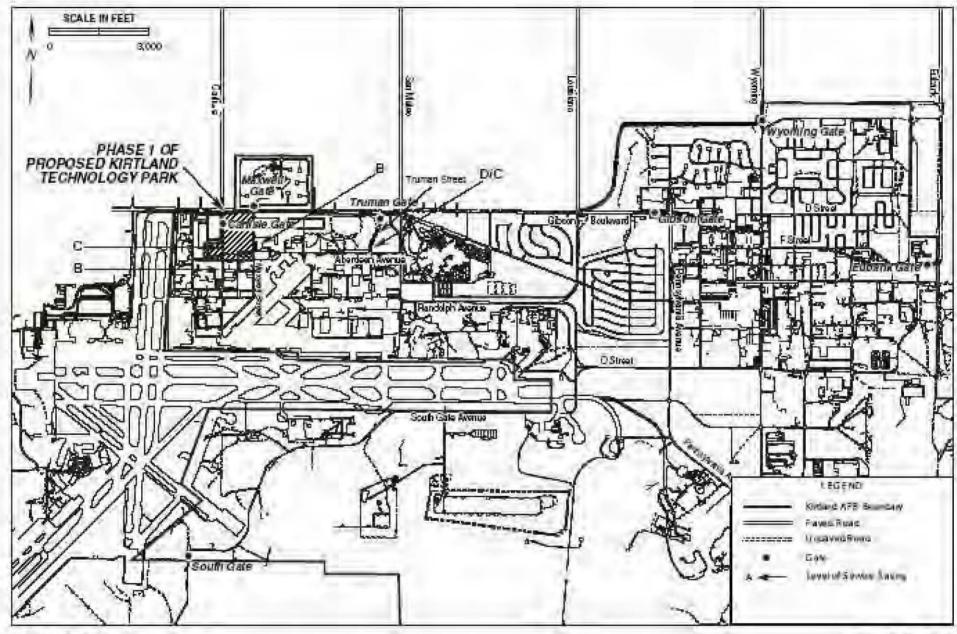
3.4.1 Definition of Resource

Socioeconomics are defined as the basic attributes and resources associated with the human environment. A Region of Influence (ROI) is defined as the geographic area or region wherein the project-induced changes to the socioeconomic environment would occur (Canter 1996).

3.4.2 Existing Conditions

New Mexico and the Albuquerque ROI represent a diverse economy. Nonagricultural employment and the transportation and services industries represent the largest growth sector in New Mexico and in the ROI.

b LOS (Transportation Research Board 2000. Highway Capacity Manual, Highway Research Board Special Report 209, National Academy of Sciences, Washington, DC).



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Kirtland Air Force Base Transportation Network and Access Gates

3-1

3.4.2.1 Population

The ROI had an estimated population of 581,442 in 2003 (US Census Bureau 2003). This was a 1.5 percent increase from 2002.

3.4.2.2 Economy within the ROI

In the Albuquerque metropolitan statistical area (MSA), the median wage (all occupations) in 2003 was \$27,398 (New Mexico Department of Labor 2005). The 2002 estimated median household income in Bernalillo County was \$39,465 (US Census Bureau 2005). Annual average unemployment rates in 2000 and 2001 within the ROI were at 3 and 3.4 percent, respectively. The Albuquerque MSA unemployment rate in 2005 has been over 5.0% (New Mexico Department of Labor 2005).

3.4.2.3 Kirtland AFB

Kirtland AFB had approximately 25,630 employees in fiscal year (FY) 2004 (USAF 2005). The goods and services purchased by base employees in the local area create secondary jobs and wages, further adding to its total economic importance to the local area. The total jobs created in the community by Kirtland AFB activities in FY 2004 were 27,771, with an economic impact valued at over \$944,000. The total value of Kirtland Air Force Base's economic impact to the local community is over \$3.3 billion (USAF 2005).

SECTION 4 ENVIRONMENTAL CONSEQUENCES

4.1 SUMMARY OF ENVIRONMENTAL RESOURCES NOT AFFECTED BY THIS ACTION

The following resources will not be impacted by the Proposed Action: health and safety; noise, land use, utilities, geological resources, water resources, biological resources, cultural resources, environmental justice, hazardous materials and waste management. The reasons for excluding them from detailed analysis are as follows:

4.1.1 Noise

Although noise would result from construction of Phase I of the KTP, it would be temporary, short-term and minor, especially when compared with noise generated by commercial and military aircraft adjacent to the Phase I KTP area. The proposed facilities would also be outside of the 65 Day-Night Average Sound Level noise contour generated by aircraft activities at the Albuquerque International Sunport. Therefore, people working in the facilities would be exposed to acceptable levels of noise from existing land uses.

4.1.2 Health and Safety

Construction and operation of the facilities in Phase I of the Kirtland Technology Park (KTP) would not occur within any runway protection zones, clear zones or explosive safety zones. All Occupational Health and Safety regulations would be followed by Air Force employees and workers. Implementation of the Proposed Action would not have a significant impact on the current health and safety environment in the proposed location site. The Proposed Action would not have any impacts on children, as children would not be in the area of the Proposed Action during construction or operation of the facilities.

4.1.3 Land Use

Most of the 36-acre Proposed Action site is in an area where land use is currently classified as housing. However, the houses were demolished and the land is currently vacant due to relocation of housing and an ongoing housing privatization program by the base. Land use for Phase I of the KTP would be changed to Administration/Research if the Proposed Action were implemented, but this would not be a significant impact.

4.1.4 Utilities

Utilities include water, wastewater, electricity, gas, sanitary sewer, telephone service, and solid waste disposal. It was determined that there would be no significant impact to utilities from construction or operation of Phase I of the KTP because utilities in the area are currently sufficient, and therefore are not analyzed detail in this EA.

4.1.5 Geological Resources

No important geological formations or soils are found in the area of the Proposed Action, therefore no impacts to these resources would occur. Existing soils are stable enough to allow structures to be built. The area is flat, so water erosion is not an issue and any soil erosion from construction activities would be controlled using standard Best Management Practices. Furthermore, once the area is landscaped it would reduce the erosion potential of the site, since most of the site is currently exposed soil.

4.1.6 Water Resources

Water resources would not be impacted by either construction or operation of the proposed KTP facilities. The nearest surface water feature, a dry arroyo, is almost two miles from the project site. The site is level and runoff from the site would not affect any surface water features. The minor amounts of impervious surfaces proposed for the project site would not affect groundwater recharge rates of aquifers underlying the 52,000-acre base. Water systems in the area were designed for a housing area and are sufficient to support the research facilities that comprise the Proposed Action.

4.1.7 Biological Resources

Biological resources are not analyzed in detail in this EA as no significant impacts would occur to this resource. No federally or state listed threatened or endangered species inhabit the area (Appendix B) and no potential habitat is located nearby. Therefore, threatened and endangered species would not be impacted. The Proposed Action is located in an area that has been heavily disturbed by grading and demolition activities. As a result, very little vegetation or wildlife are found in the area, and impacts to these resources would be insignificant. The burrowing owl is the only sensitive species with the potential to be found near the Proposed Action, although none are currently using the site. Kirtland AFB will inspect the site before initiating construction and, if needed, will implement existing procedures to relocate an owl. Following these approved procedures will avoid any impacts to the local burrowing owl population.

4.1.8 Cultural Resources

Several archaeological surveys have been conducted on the developed portion of the base including the proposed location of the KTP. Results of these surveys revealed no significant cultural resources, historic or prehistoric within the proposed project boundaries. The developed area has been subjected to repeated surface modifications. As a result, no impacts would occur to known cultural resources from implementation of the Proposed Action.

4.1.9 Environmental Justice

Although the Albuquerque Region of Influence has relatively high percentages of minority and low-income populations, the Proposed Action would not have any

significant impacts and therefore would not disproportionately affect these communities. Therefore, possible impacts to populations identified in Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, would be negligible and are not analyzed in detail in this EA.

4.1.10 Hazardous Materials and Waste Management

Construction of the KTP would result in a minor short-term increase in the generation of non-hazardous and hazardous waste. The Proposed Action will not result in the generation or storage of bulk quantities of hazardous materials (HM). All HM generated by the AFRL at the PRS is currently managed by the KAFB Environmental Management Department in accordance with existing published guidance. All HM generated as a result of the Proposed Action will be managed likewise. All operations involving hazardous materials at AFRL are handled under existing AF Form 813s. Any new operations under the Proposed Action will require new AF Form 813s. This resource is not analyzed in detail in this EA.

4.2 SUMMARY OF ENVIRONMENTAL RESOURCES AFFECTED BY THIS ACTION

4.2.1 Visual Resources

4.2.1.1 Methodology

Methodologies for determining the impacts to visual resources are based on the level of visual sensitivity of an area. After assessing the visual character and relative sensitivity of the affected setting, changes to the landscape associated with the Proposed Action and alternative were analyzed in terms of their potential to noticeably alter existing viewsheds.

4.2.1.2 Impacts from Proposed Action

Phase I of the AFRL KTP would be constructed in an area currently occupied by land left vacant by the demolition of military family housing. It would consist of approximately 36 acres upon which about 535,000 square feet of development area is planned.

During construction, views of the proposed site location would include viewable construction equipment and materials. This would not result in a significant impact to the visual environment as it would be temporary. Once construction was completed, visual resources would be permanently altered by the addition of the Phase I facilities. The current vacant lots would be occupied by modern administration and office facilities and laboratories surrounded by landscaping. The proposed KTP facilities would have a minor beneficial impact on visual resources when compared to the current visual resources of the vacant lot. The KTP complex would be designed to blend in with existing facilities.

4.2.1.3 No-Action Alternative

No changes to visual resources would result from selection of the No-Action Alternative.

4.2.2 TRANSPORTATION

4.2.2.1 Methodology

Impacts to transportation and circulation are assessed by determining an action's potential to change current transportation patterns, systems, service, and safety. Impacts may arise from physical changes to circulation (e.g. closing, rerouting, or creating roads), construction activity temporarily disrupting existing local-area traffic patterns, or changes in daily or peak-hour traffic volumes created by workforce and population changes related to installation activities.

Potential impacts to transportation and circulation from the Proposed Action and alternative were analyzed by: (1) identifying and describing transportation and circulation that could affect or be affected by the project; and (2) examining the effects the action may have on the resource.

4.2.2.2 Impacts from the Proposed Action

Construction of the proposed facilities would have a minor short-term impact on transportation as a result of increased traffic from construction vehicles and heavy-duty equipment.

Operation of the KTP would bring approximately 2,000 additional people traveling onto the base to use the New Mexico Tech Facility. Much of this increase in vehicles would be staggered throughout the day and days of week. Traffic volumes in the area, particularly on Gibson Blvd. near the project site, could experience an increase of approximately 8 percent if all 2,000 people arrived at once. However, this increase would be partially offset by the reduction in traffic on Gibson Blvd. that would occur from relocation of the Truman Gate. Gibson is congested during the morning and afternoon rush hours, but not all day long. 1) Improving the traffic flow on Gibson by removing the backed up traffic from Gibson to Truman would certainly improve the LOS rating of the street, whether it changed the number of vehicles on the road or not. 2) It can easily be seen from Figure 3-1 that the Carlisle Gate is immediately adjacent to the proposed KTP location and would be the gate used by the majority of people accessing the KTP. The Truman Gate could be used by people coming west on Gibson, but, even under those circumstances, it would make more sense to use the Carlisle Gate to access the KTP. 3) Therefore, there would be little impact to traffic at the Truman Gate or on Truman Street from the proposed KTP and the impact to traffic on Gibson would be spread throughout the day. As a result, Level of Service (LOS) would not significantly change on the main roads and arteries in the KTP area during peak hours and would remain at current LOS designations both on and off base.

4.2.2.3 No-Action Alternative

Selection of the No-Action Alternative would result in no change to current transportation conditions at Kirtland AFB.

4.2.3 SOCIOECONOMICS

4.2.3.1 Methodology

Impacts on population and expenditure are assessed by determining an action's direct effect on the local economy and related effects on other socioeconomic resources. The magnitude of potential impacts can vary greatly depending on the location of a proposed action; for example, the termination of an operation that employs 25 people in a major metropolitan area may be virtually unnoticed while the same action could have significant adverse impacts in a small community.

Potential impacts to socioeconomic resources were analyzed by: (1) identifying and describing socioeconomic resources that could affect or be affected by the project; and (2) examining the effects the Proposed Action may have on these resources.

4.2.3.2 Impacts from the Proposed Action

Socioeconomic impacts from implementation of the Proposed Action would be beneficial, but minor. Purchase of construction materials and salaries paid to construction workers would constitute a minor, temporary, beneficial impact on the local economy. Contracts for construction equipment would also have a temporary, beneficial impact. Potential job creation from operation of the Phase I KTP would be minor as most of the personnel would come from existing facilities on and off base. Therefore, it would not contribute substantially to Kirtland's local economic impact. In a metropolitan area the size of Albuquerque, these impacts would be negligible.

4.2.3.3 No-Action Alternative

Selection of the No-Action Alternative would not result in any changes to socioeconomics in the Albuquerque area.

4.2.4 Air

4.2.4.1 Methodology

The Clean Air Act (CAA) General Conformity Rule states that nonattainment (see Appendix A) and maintenance areas must conform to the applicable State Implementation Plan. Kirtland AFB is covered by a carbon monoxide (CO) maintenance plan, and the applicable de minimis level for CO is 100 tons per year (tpy). Furthermore, total CO emissions in the Albuquerque-Bernalillo County air basin were 190,540 tpy in 1999, the latest year for which these data are available. CO emissions from mobile, area, and stationary, as well as construction phase emissions associated with a project at

Kirtland AFB would not be considered regionally significant unless they were in excess of 10 percent of total CO emissions. The CAA conformity rule states that only net emissions must be considered.

4.2.4.2 Impacts of Proposed Action

Temporary air quality impacts associated with construction activities would occur from: (1) fugitive dust from earthmoving, ground disturbance, debris handling and wind erosion of soil stockpiles; and (2) products of combustion from construction equipment. Construction-related impacts on air quality would be temporary effects from short-term activities. Fugitive dust emissions were calculated assuming 12 acres of ground disturbance.

Potential particulate matter equal to or less than 10 micrometers in diameter (PM_{10}) emissions were calculated using a PM_{10} emission factor of 0.77 tons/acre (assuming 64 percent of construction-related fugitive dust is PM_{10} (US EPA 1995, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, OAQPS. Fifth Edition). PM_{10} emissions are estimated to be 9.2 tons for construction activities, which is well below the PM_{10} threshold level for General Conformity Applicability (US EPA 1995, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, OAQPS. Fifth Edition).

Emissions of sulfur dioxides (SO_2), oxides of nitrogen (NOx), and volatile organic compounds (VOCs) were calculated using the USAF Air Conformity Applicability Model (2004b). SO_2 , NO_x , and VOCs from construction equipment exhaust, calculated based upon these data, would be within the range of 1-10 tpy per pollutant.

The calculations for CO that would result from the Proposed Action would be between 20 tpy (taken from Table 4-1 calculations) and 32 tpy (from calculations from the USAF ACAM model, using 535,000 sq ft office/employment space, 12 acres to be graded, dust controls in place with grading lasting 30 days and construction lasting 182 days and 2,780 personnel being realigned). This would be well below the General Conformity Applicability threshold of 100 tpy (EPA 1991 and USAF 2004b)

Table 4-1. Potential Carbon Monoxide Emissions Generated by Construction Activities

	CO Emission Factors ^a	Total CO Emissions	Total CO Emissions
Categories	lb/hr	lb/yr	tpy
Contractor-Owned Vehicles ^b	1.70	2,720	1.36
Off-Highway Trucks	3.68	5,888	2.94
Excavator	1.49	2,384	1.19
Compressor	1.07	1,712	0.86
Crane	1.63	2,608	1.30
Tractor/Loader/Backhoe	2.91	4,656	2.33
Cement/Mortar Mixer	0.98	1,568	0.78
Asphalt Pavers	0.63	1,008	0.50
Roller	0.61	976	0.49
Scraper	2.67	4,272	2.14
Bore/Drill Rigs	1.97	3,152	1.58
Dumpers/Tenders	3.68	5,888	2.94
Other Construction Equipment	1.97	3,152	1.58
Total	22.82	39,984	19.99

Albuquerque/Bernalillo County Standard ^c	100 tpy
Environmental Protection Agency Standard ^d	100 tpy

Notes:

- ^a Emission Factors for heavy-duty, diesel-powered construction equipment were obtained from the Nonroad Engine and Vehicle Emission Study-Report, Office of Air And Radiation, Environmental Protection Agency, November 1991.
- b Calculation of the Contractor Owned Vehicles Category was calculated using the United States Air Force Air Conformity Applicability Model for 30 contractor-owned vehicles commuting to the base using a 30-mile round trip.
- ^c Standard obtained from Ambient Air Quality, New Mexico Environment Department, Air Quality Bureau, October 2002.
- ^d 40 Code of Federal Regulation 93.153(B)(1) CO Standard for Non-Attainment Areas.
- CO=carbon monoxide lb/yr=pounds per year tpy=tons per year

Assumptions: The work period for each of the categories of equipment was calculated for two pieces of equipment running 8 hours per day for 5 days per week for 40 weeks. Each project would generate specific amounts of CO based on the duration of the project. The amount of CO emitted is tabulated both individually by project, and combined as if all construction project activities occurred concurrently.

Operation emissions from Phase I of the KTP based on 535,000 total square feet of interior finished floor space would be 0.01 tpy of SO_2 , 2.2.1 tpy of NO_X , 0.11 tpy of VOCs, 0.16 tpy of PM_{10} , and 1.80 tpy of CO. These emissions would result from facility heating and air conditioning (USAF 2004b).

The Proposed Action would have a temporary short-term adverse impact as a result of increased dust from ground clearance and site preparation activities, and emissions from construction vehicles and heavy-duty equipment. Long-term minor impacts to air quality associated with operation of the proposed facilities would occur from increases in traffic accessing the base, as well as from facility heating and air conditioning. The Proposed Action would not significantly change the regional or site-specific air quality as described in Section 3.

4.2.4.3 No-Action Alternative

Under the No-Action Alternative, the KTP would not be constructed. No changes to air quality would result from selection of the No-Action Alternative.

SECTION 5 CUMULATIVE EFFECTS

5.1 CUMULATIVE EFFECTS

Council on Environmental Quality (CEQ) regulations stipulate that the cumulative effects analysis in an Environmental Assessment (EA) should consider the potential environmental impacts resulting from "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 Code of Federal Regulation 1508.7). Recent CEQ guidance in considering cumulative effects affirms this requirement, stating that the first steps in assessing cumulative effects involves defining the scope of the other actions and their interrelationship with a proposed action. The scope must consider other projects that coincide with the location and timetable of a proposed action and other actions. Cumulative effects analyses must also evaluate the nature of interactions among these actions (CEQ 1997).

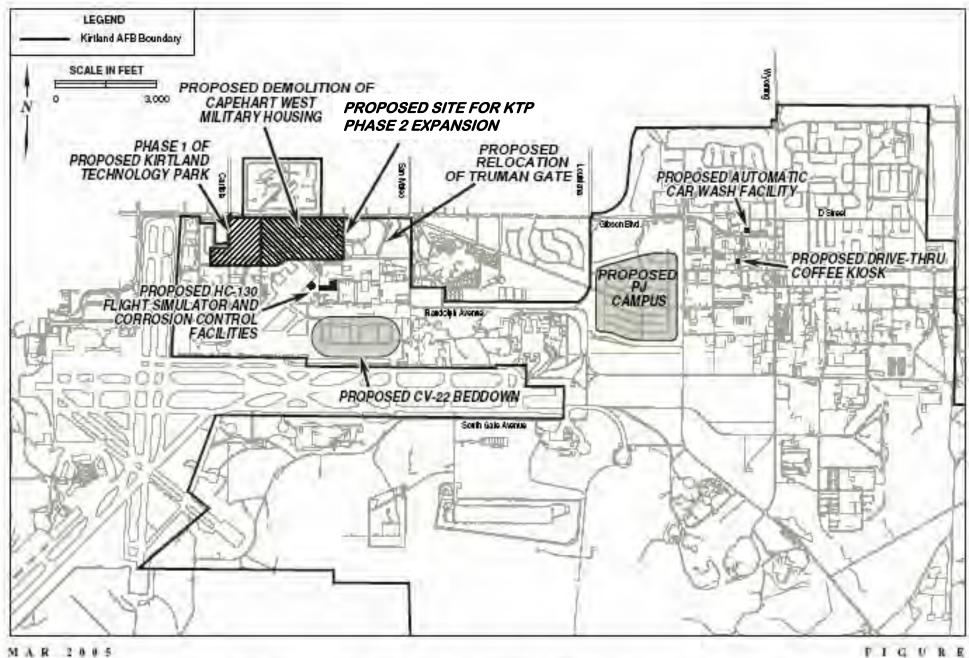
5.1.1 Past Actions Relevant to the Proposed Action and Alternative

Kirtland Air Force Base (AFB) is a large, active military installation that undergoes changes in mission and in training requirements. This process of change is consistent with the US Department of Defense policy that military installations must be ready to respond to constantly changing threats to American interests throughout the world. To assess these continuing changes, the 377th Air Base Wing at Kirtland AFB has prepared EAs of military construction actions every year for the past several years. Those EAs document the potential impacts of multiple proposed construction actions across the 52,000 acre base (Appendix C).

5.1.2 Present Actions Relevant to the Proposed Action and Alternative

Kirtland AFB has over 400 tenant organizations housed in facilities that range from the 1940s to the present. As a result, demolition of old facilities, new construction, facility improvements, and infrastructure upgrades occur regularly. There are two currently ongoing projects that could have cumulative impacts associated with the Proposed Action in this EA (Figure 5-1).

- Aging base housing is being demolished as new housing is made available. This will continue over the next several years until all of the old housing has been removed. Some of the housing proposed for demolition is immediately east of the location selected for Phase 1 of the Kirtland Technology Park (KTP).
- The Truman Gate is being relocated farther south along Truman St. between Gibson Blvd. and Aberdeen Ave. The new gate would provide paved parking areas, security gates, signs, fencing and landscaping. This relocation will allow a greater stacking distance for traffic exiting Gibson Blvd.



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EA

Cumulative Projects in the Vicinity of Phase I of Proposed Kirtland Technology Park Kirtland Air Force Base

5.1.3 Reasonably Foreseeable Actions Potentially Having Cumulative Environmental Impacts

This category of actions includes other proposed actions that have a potential to coincide, either in time or geographic extent, with the Proposed Action. Information on these actions is included to determine whether these actions would, if implemented, incrementally affect environmental resources. Figure 5-1 shows the locations of other actions relative to the Proposed Action discussed in this document. These currently proposed actions include:

- the ongoing demolition of aging military family housing (discussed above);
- the ongoing relocation of Truman Gate;
- the proposed construction of a campus for pararescue/parajumper training by the 58th Special Operations Wing 58 (58 SOW) of Air Education and Training Command. Construction is proposed in an area currently occupied by aging military housing which would be demolished to make room for the campus;
- the proposed construction and operation of an HC-130P Flight Simulator Facility and a Corrosion Control Facility by the 58 SOW;
- the proposed construction and operation of a Automatic Car Wash and Drive-Thru Coffee Kiosk by Army and Air Force Exchange Services;
- the proposed beddown of a training wing of CV-22 Osprey tilt-rotor aircraft at Kirtland AFB; and
- the proposed construction and operation of Phase 2 of the KTP. Although the KTP may include additional phases of development, no specific plans for the proposed future phases are developed, other than the proposed timelines. Phase 2 is anticipated approximately five years after the Proposed Action, and Phases 3 and 4 is not anticipated for at least another ten to fifteen years after that. Therefore the cumulative impacts of these proposed actions are not fully evaluated.

5.2 Potential Cumulative Effects

An analysis was done of the potential for cumulative impacts resulting from the actions described above when combined with the proposed construction and operation of Phase I of the KTP. All the actions identified in Section 5.1 are federal actions, with the requisite NEPA analyses done or in progress. The draft or final Environmental Assessments of each of those actions listed above have identified no significant adverse or beneficial impacts from each of the activities individually or cumulatively.

The scope of this cumulative effects analysis was limited to the resources analyzed in Section 4 of this EA. The following resources were not analyzed in this EA: health and safety, noise, land use, utilities, geological resources, water resources, biological resources, cultural resources, hazardous materials and waste management. Since the Proposed Action would have negligible impacts on these resources, it would not contribute to cumulative impacts in these areas either.

The four resources that were analyzed in Section 4 for this Proposed Action, and are therefore examined in this cumulative analysis, are air quality, visual resources, transportation, and socioeconomics effects. The potential impacts of this Proposed Action were added to those of the other proposals, and evaluated for cumulative significance.

5.2.1 Air Quality

Construction activities that use large equipment or large vehicles produce carbon monoxide, an emission monitored in the Albuquerque-Bernalillo County area. In addition, fugitive dust is created from the soil disturbance during construction. Permits are required by the City of Albuquerque-Bernalillo County for construction operations which disturb ¾ acre or more. The fugitive dust at these sites is monitored by the Albuquerque-Bernalillo County Air Quality Control Board and construction activities are restricted if air quality is being degraded. Although Albuquerque-Bernalillo County is under a 20-year State Implementation Plan (SIP) to reduce carbon monoxide emissions, the air quality in Bernalillo County has improved to the extent that, as a result of the 10-year review, the measures in the SIP are being modified to be less restrictive. The combined emissions from the Proposed Action, when considered with potential emissions from the other actions considered, are not expected to have any significant cumulative impacts on air quality.

5.2.2 Visual Resources

All resources constructed on Kirtland AFB will have minor temporary and short-term negative impacts on the visual environment during the construction. However, the actions identified for this analysis are geographically separated and the timelines for construction/demolition overlap only slightly, so that there is no overall significant impact. Once construction is complete, there is a minor beneficial impact as all construction is designed to complement existing facilities and is surrounded by landscaping designed for low maintenance and water usage in accordance with the Kirtland AFB General Plan.

5.2.3 Transportation

The greatest impact to transportation is from the operation of the KTP, with 2,000 additional people traveling onto the base to use the New Mexico Tech Facility at various times through the week. The traffic associated with the other present and reasonably foreseeable actions are primarily associated with construction and the demolition of housing, not the operations following those ongoing and proposed projects. The greatest potential impacts to transportation would be related to the presence of military housing east of the Phase I of the proposed Kirtland Technology Park. One hundred sixty-one units remain occupied in the eastern portion of Capehart West military housing; however these units are scheduled to be demolished within the next year. The increased traffic from the Proposed Action would be offset by the loss of the present traffic generated by the families living in Capehart West. Because the other planned projects will take place in various more-distant locations around the installation, and during different time frames, it is unlikely there will be any significant cumulative effects on transportation.

5.2.4 Socioeconomics

The total value of Kirtland AFB's economic impact to the local community was over \$3.3 billion in fiscal year 2004 (FY04). Military construction on Kirtland accounted for over \$17.5 million and other construction for over \$15.3 million during that time (KAFB, *Economic Impact Statement Fiscal Year 2004*) The construction of the proposed KTP when considered with all other construction occurring at Kirtland AFB is expected to add slightly to the overall economy of the community over a longer period of time than the other actions considered. Most of the other proposed actions are not as extensive and do not have any additional impact on the community following construction, other than the economic benefit through any repair and maintenance which would be contracted. The Proposed Action also brings additional individuals to the installation, but most are drawn from existing facilities elsewhere in Albuquerque. As a result, the cumulative effects of the proposed action when considered with all the proposed and foreseeable actions will continue the current economic benefit to the area but with no significant change expected.

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APPENDIX A AIR QUALITY

APPENDIX A AIR QUALITY

The United States Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for criteria pollutants. These pollutants are generated by fossil fuels and generally result from operation of motor vehicles and industrial facilities. Criteria pollutants include: Ozone (O_3) , lead, sulfur dioxide, particulate matter equal to or less than ten micrometers in diameter, particulate matter equal to or less than 2.5 micrometers in diameter, carbon monoxide, and oxides of nitrogen (NO_X) .

Clean Air Act (CAA). The CAA Amendments of 1990 place most of the responsibility on the states to achieve compliance with the NAAQS. The primary vehicle for compliance is the State Implementation Plan (SIP), which the EPA requires each state to prepare. A SIP is a compilation of goals, strategies, schedules, and enforcement actions that would lead the state into compliance with all federal air quality standards. Changes to the compliance schedule or plan must be incorporated into the SIP, which outlines measures by which the state can attain the NAAQS for criteria pollutants. Areas not in compliance with a standard can be declared a non-attainment area by the EPA and/or the appropriate state or local agency.

The CAA Amendments of 1990 require federal agencies to conform to the SIP with respect to achieving and maintaining attainment of the NAAQS (see Table A-1) and addressing air quality impacts. An air quality impact resulting from a proposed action would be significant if it would: (1) increase concentrations of ambient criteria pollutants or O₃ precursors to levels exceeding NAAQS, (2) increase concentrations of pollutants already at nonattainment levels, (3) lead to establishment of a new nonattainment area by the governor of the state or the EPA, or (4) delay attainment in accordance with the SIP.

Hazardous Air Pollutants (HAPs). HAPs are those pollutants that are known or suspected of causing cancer or other serious heath effects or adverse environmental effects. The CAA categorizes 188 pollutants as HAPs.

General Conformity Rule. The 1990 CAA amendments require a conformity analysis for actions potentially affecting air quality in non-attainment and maintenance areas. If total direct and indirect emissions are estimated to exceed emission thresholds, a conformity determination is required. The calculation of total direct and indirect emissions does not have to make specific reference to conventional emission source categories (i.e. stationary, area and mobile sources). The total direct and indirect emissions of criteria pollutants attributable to the proposed action (e.g. O₃ precursors) must be considered. O₃ precursors include volatile organic compounds and NO_X. Indirect emissions that must be considered are limited to emissions that could be practicably controlled.

A conformity applicability analysis is required to determine whether a federally proposed action is subject to requirements for a conformity determination under EPA's General

Conformity Rule. The initial step in determining applicability of the General Conformity Rule is to compare projected pollutant emissions with baseline emissions (40 Code of Federal Regulation [CFR] § 51.853[b]). Conformity determinations are conducted to ensure that NAAQS would not be exceeded and that the proposed action would comply with all federal and state air quality regulations, goals, and plans. The threshold limits to determine if a conformity determination should be accomplished are identified in 40 CFR § 93.153. If the area is designated nonattainment for a pollutant, but the proposed action's emissions would not exceed the de minimis threshold and would be less than 10 percent of the total emissions budget for the region, a record of nonapplicability is prepared.

Prevention of Significant Deterioration (PSD) and Title V Operating Permits. Under the CAA, new stationary sources that are proposed for areas are subject to the requirements of the PSD regulations. The PSD regulations require proposed new stationary sources with emissions of criteria pollutants above 250 tons per year (tpy), or 100 tpy for specific source categories, to conduct an air quality impact analysis and demonstrate compliance with Best Available Control Technology requirements. Under the CAA Amendments Title V Operating Permits Program, all sources in attainment areas with emissions of criteria pollutants above 100 tpy must obtain a federal operating permit. The PSD/Title V major source threshold of 100 tpy for attainment pollutants was used to evaluate the proposed action's significance for air quality impacts, in accordance with the requirements of 40 CFR § 51.853.

Under Section 176(c) of the CAA, a framework is provided to ensure that federal actions conform to appropriate state or federal implementation plans. Before a federal agency or department engages in, supports, finances, licenses, permits, or approves any activity, that agency must ensure that such actions conform to the applicable implementation plan. According to the 1990 CAA amendments, the purpose of an air quality implementation plan is to eliminate or reduce the severity and number of violations of NAAQS and achieve expeditious attainment of these standards. Federal actions must not conflict with the implementation plan by causing or contributing to any new violation, increasing the frequency or severity of any existing violation, or delaying timely attainment of a standard or required interim milestone. If the proposed action does not conform to the SIP, it cannot be approved or allowed to proceed.

Table A-1. National and New Mexico Ambient Air Quality Standards

		NAAQS Primary	Secondary	
Pollutant	Averaging Time	Standards ^a	Standards ^b	NMAAQS ^c
	8-hour ¹	0.08 ppm	Same as Primary	0.08 ppm
		$(157 \mu g/m^3)$		$(157 \mu g/m^3)$
Ozone	2			
	1-hour ²	0.12 ppm	Same as Primary	0.12 ppm
	3	$(235 \mu g/m^3)$		$(235 \mu g/m^3)$
	8-hour ³	9 ppm	None	8.7 ppm
C. I. W I		(10 mg/m^3)		$(9,900 \mu \text{g/m}^3)$
Carbon Monoxide	1-hour ³	25	Nama	12.1
	1-nour	35 ppm (40 mg/m^3)	None	13.1 ppm
	Annual (Arithmetic	(40 mg/m^3) 0.053 ppm	Same as Primary	$(14,900 \mu \text{g/m}^3)$ 0.05 ppm
	mean)	$(100 \mu \text{g/m}^3)$	Same as Primary	$(100 \mu \text{g/m}^3)$
Oxides of Nitrogen	mean)	(100 μg/III)		(100 μg/III)
Oxides of Nitrogen	24-hour	None	Same as Primary	0.10 ppm
	24 11001	Ttone	Same as i innary	$(200 \mu g/m^3)$
	Annual (Arithmetic	0.03 ppm		0.02 ppm
	mean)	$(80 \mu \text{g/m}^3)$		$(52 \mu g/m^3)$
	,	, , ,		, , ,
Sulfur Dioxides	24-hour ³	0.14 ppm		0.10 ppm
		$(365 \mu g/m^3)$		$(260 \mu g/m^3)$
	2			
	3-hour ³		0.5 ppm	0.5 ppm
	4	2	$(1,300 \mu g/m^3)$	$(1,300 \mu g/m^3)$
Particulate Matter equal to or	Annual ⁴	$50 \mu\mathrm{g/m}^3$	Same as Primary	$15 \mu\mathrm{g/m}^3$
less than 2.5 micrometers in	(Arithmetic mean)			
diameter	241 3	150 / 3	G D:	150 / 3
	24-hour ³	$150 \mu \text{g/m}^3$	Same as Primary	$150 \mu g/m^3$
Particulate Matter equal to or	Annual ⁵	15 μg/m ³	Same as Primary	$15 \mu\mathrm{g/m}^3$
less than 10 micrometers in	(Arithmetic mean)			
diameter	24-hour ⁶	65 μg/m ³	Same as Primary	$65 \mu g/m^3$
Lead	Quarterly Average	$1.5 \mu\mathrm{g/m}^3$	Same as Primary	$1.5 \mu\mathrm{g/m}^3$

Source: Environmental Protection Agency 2004b. Title 40, Part 50 of the Code of Federal Regulations.

Notes: ¹ To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average O₃ concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

Not to be exceeded more than once per year.

NAAQS=National Ambient Air Quality Standards NMAAQS=New Mexico Ambient air Quality Standards ppm=parts per million $\mu g/m^3$ =micrograms per cubic meter mg/m^3 =milligrams per cubic meter O_3 =ozone PM_{10} =particulate matter equal to or less than 10 micrometers in diameter

The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is <=1, as determined by Appendix H.

 $^{^4}$ To attain this standard, the expected annual arithmetic mean PM_{10} concentration at each monitor within an area must not exceed $50\,\mu\text{g/m}^3$.

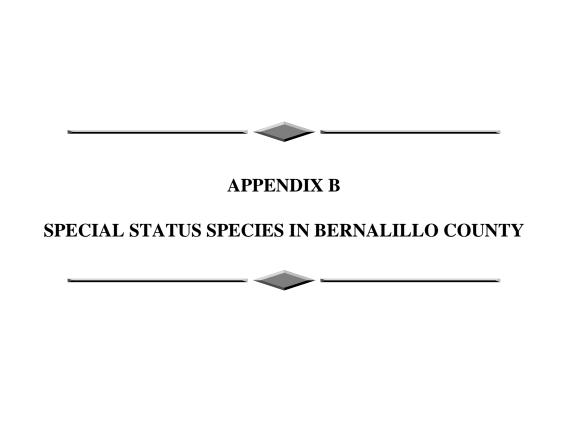
⁵ To attain this standard, the 3-year average of the annual arithmetic mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 15.0 μg/m³.

⁶ To attain this standard, the 3-year average of the 98^{th} percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed $65 \mu g/m^3$.

^a Set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly.

b Set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

^c New Mexico Ambient Air Quality Standards (20.2.3 New Mexico Administrative Code – Ambient Air Quality Standards)



APPENDIX B

TABLE B-1. SPECIAL STATUS SPECIES IN BERNALILLO COUNTY

Common Name	Scientific Name	Status	Occurrence on Kirtland AFB	Occurrence Within Withdrawal Area	Habitat	Season	Behavior
REPTILES							
Texas horned lizard	Phrynosoma cornutum	FSC	Potential	Potential	G, PJ	AY	Breeds
BIRDS							
Bald eagle	Haliaeetus leucocephalus	FT, ST	Potential	Potential	G, PJ, P	SP, F	Transient
Ferruginous hawk	Buteo regalis	FSC	Potential	Potential	G, PJ, P		
Burrowing owl	Athene cunicularia hypugaea	FSC	Yes	Yes	G, PJ	SP, SM, F	Transient, nest in summer
Mexican spotted owl	Strix occidentalis lucida	FT, CH	Potential	Potential	PJ, P	AY	Transient, breeds in summer
Loggerhead shrike	Lanius ludovicianus	FSC	Yes	Yes	G, PJ, R	AY	Transient, nests in summer, winter resident
American peregrine falcon	Falco peregrinus anatum	ST	Potential	Potential	G, PJ, P	SP,SM, F	Transient
Gray vireo	Vireo vicinior	ST	Yes	Yes	G, PJ	SP, SM	Transient, breeds in summer
Baird's sparrow	Ammodramus bairdii	ST	Potential	No	G, PJ	F	Transient
MAMMALS							
New Mexican jumping mouse	Zapus hudsonius luteus	ST	Potential	No	R	AY	Breeds
PLANTS							
Santa Fe Milkvetch	Astragalus feensis	S	Yes	No	G	AY	Grows

Sources: New Mexico Department of Game and Fish 2004, New Mexico Natural Heritage Program 2003, US Fish and Wildlife Service 2004.

Notes:

FE = Federal Endangered ST = State Threatened G = Grassland AY = All Year S = State Sensitive

 $FT = Federal \ Threatened \\ C = Federal \ Candidate \\ SE = State \ Endangered \\ FSC = Federal \ Species \ of \ Concern \\ PCH = Proposed \ Critical \ Habitat \\ P = Ponderosa \\ R = Riparian \\ F = Fall$ $SP = Spring \\ P = Ponderosa \\ R = Riparian \\ F = Fall$

Five special status species are known to inhabit Kirtland Air Force Base (AFB). The state threatened gray vireo is known to nest at the installation in the juniper woodland community. This vegetation community is located more than five miles east of the Proposed Action. Three federal species of concern have been recorded to occur at Kirtland AFB: western burrowing owl, loggerhead shrike, and Texas horned lizard.

Loggerhead shrikes are found in the grassland and shrublands of the base, but generally are not found in developed areas. The western burrowing owl inhabits abandoned prairie dog burrows which are found in vacant lots around the developed area and throughout the grasslands. Currently, no burrowing owl nesting sites are present at the location of the Proposed Action (Finley 2004). The Texas horned lizard has been observed at the base, but this record may be the result of released or escaped individuals (Degenhardt et al. 1996). Santa Fe milkvetch, a state sensitive species, has been documented in the southwestern grasslands of the base, but does not occur in the developed area.

APPENDIX C

RECENTLY COMPLETED ENVIRONMENTAL ASSESSMENTS AT KIRTLAND AIR FORCE BASE

APPENDIX C RECENTLY COMPLETED ENVIRONMENTAL ASSSESSMENTS AT KIRTLAND AIR FORCE BASE

July 2004. Final Kirtland Air Force Base Perimeter Fencing EA.

November 2003. Final Kirtland Air Force Base Prairie Dog Management Program EA.

September 2003. Final Kirtland Air Force Base Arsenic Compliance System EA.

January 2003. Final 2002 Construction and Demolition Projects EA.

December 2002. Final Kirtland Air Force Base Southern Fence EA.

April 2002. Kirtland Air Force Base Fire, Crash and Rescue Facility EA.